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ABSTRACT

This study evaluated a cognitive-process approach used to train three secondary-aged students with moderate mental retardation on a social skill involving response to criticism. The cognitive-process approach teaches a generative process of social behavior rather than specific component behaviors; relies on receptive and expressive language skills; actively involves learners; and requires learners to analyze, discriminate, and respond to multiple stimuli. In this study, subjects were presented with five scenarios depicting workers being criticized, and were then given training in four components of the cognitive-process approach: social decoding skills, social decision skills, social performance skills, and social evaluation skills. Instructional techniques included modeling, rehearsal, and feedback. Two of the three students successfully learned the process and generalized their performance to untrained stimuli after process training. (25 references) (JDD)

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Using a Cognitive-Process Approach to Teach Social Skills[1]

Lana Collet-Klingenberg and Janis Chadsey-Rusch

To date, few studies have focused on teaching appropriate social skills related to employment (Chadsey-Rusch, 1990). Most studies have utilized a traditional social skill training approach that typically consists of a rationale for why the behavior is important, examples of the behavior, an opportunity to practice the behavior, and feedback regarding performance. Social skills taught have included interviewing (Kelly, Wildman, Urey, & Berler, 1980), compliance (Karlan & Rusch, 1982), question-asking in conversations (Chadsey-Rusch, Karlan, Riva, & Rusch, 1984), and accepting criticism, taking a joke, and soliciting assistance (Shafer, Brooke, & Wehman, 1985). Although this research has been successful in teaching social skills, few studies have shown generalization of skills beyond the brief periods of initial procedural evaluation.

Recently, several researchers have advocated using a cognitive-process approach to teach social skills because it may promote generalization (Chadsey-Rusch, 1986; Hollin & Trower, 1988; Ladd & Mize, 1983; McFall, 1982; Park & Gaylord-Ross, 1989). This approach typically involves teaching a generative process of social behavior rather than specific component parts (Hollin & Trower, 1988). Individuals are taught to (a) formulate goals for social interactions, (b) decode or interpret salient cues inherent in social contexts, (c) decide on overt behaviors that would best meet the social goal(s) and the social situation, (d) perform the behavior, and (e) judge whether or not the performed behavior was effective in meeting their goal(s) and in eliciting positive or neutral feedback from the others involved in the interaction. This approach is promising because, once learned, individuals may then utilize it across a variety of social contexts.

Unfortunately, there are few demonstrations of a cognitive-process model being used to teach social skills. In one of the few studies, Park and Gaylord-Ross (1989) used this approach to teach social skills to three individuals with mental retardation who were

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working in nonsheltered employment settings. One subject was trained to decrease mumbling and increase social initiations and conversational expansions. Contingent effects were seen in the training setting with the onset of process training and the effects generalized to the nontraining or work setting. Two additional subjects were trained to exhibit initiations, expansions, and terminations in conversations. First, the subjects were trained to exhibit these behaviors with a traditional social skills training approach, and then they were trained to exhibit the behaviors using a process approach. No generalization effects appeared in the criterion work setting until the process model was instituted. Park and Gaylord-Ross (1990) demonstrated that youth with mental retardation could learn the process for generating social behaviors, and that the process approach did lead to the generalization of behaviors across settings. Additionally, this study suggested that a cognitive-process approach may be more effective for training job-related social skills than a traditional social skills training approach..

Clearly, further work is needed to better understand the cognitive-process approach to teaching social skills. The primary purpose of this investigation was to determine if a cognitive-process approach could be learned by secondary-aged students with moderate mental retardation. In particular, specific attention was paid to the students' process of learning this approach. Generalization across untrained exemplars and settings was also measured.

Methods

Subjects and Settings

Three students participated; each attended a public, segregated school and was identified by his or her classroom teacher, speech therapist, and vocational coordinator as not handling criticism appropriately at school or while receiving training in a work site. Two of the students worked part-time in integrated employment settings and the other student was involved in an integrated work-training program.

Claire was 21 years old, had an estimated IQ score of 42 (Stanford-Binet), and was diagnosed as having Down Syndrome, diabetes, and visual impairment. Her expressive speech involved the use of three- to four-word utterances. Receptively, Claire followed two- and three-step directions (e.g., "I'll get ready and then wait for you here. Go talk to your teacher and meet me in the other room"). Claire worked 20 to 30 hours a week at a fast-food restaurant. She had been employed at this restaurant for nearly a year and most of her work was unsupervised by school staff (i.e., she was supervised by a restaurant manager, with occasional visits by a vocational trainer). Claire liked her job and appeared to look forward to going to work each day.

Diane was 19 and had an IQ score of 36 (Stanford-Binet). Her speech was difficult to understand and others frequently asked her to repeat herself. Diane could follow simple directions, such as "repeat after me," however, she had difficulty following two-step directions. Additionally, her attention span was short and she frequently had to be directed back on-task. Diane was involved in a work experience program at a local hospital two days a week (for a total of 6 hours). She worked with other students having disabilities and was constantly supervised by school staff. Her work supervisor commented that Diane was not really interested in her job.

Jenny was 19 years old, had an IQ of 52 (Stanford-Binet), and was diagnosed as having Down Syndrome. She was able to communicate using three- to five-word utterances and could carry on simple conversations (e.g., "I was working too slow. My boss told me to move. I tried to work faster."). She was also able to understand and follow complex directions and lengthy explanations. Like Claire, Jenny was employed 20-30 hours a week at a fast food restaurant. Her work was supervised by another worker at the restaurant and occasionally by school staff. She had worked at the restaurant for over a year and often spoke of how much she liked her job.

Social skill training was conducted in a classroom separate from the participants' homeroom. Generalization to natural environments was measured in the participants'

homeroom at school and at each participants' work setting, while generalization to untrained exemplars was probed during each training session.

Materials

Hand-drawn pictures of ten social situations depicting work-related criticism were used during training sessions. A training script, which accompanied the pictures, was developed to insure consistency across training sessions and across subjects.[2] Five of the pictures and scripts were used during training, and five were used for generalization probes.

At each work setting, the subjects wore micro-cassette recorders (Panasonic, RN-125, Micro-cassette Recorder t.m.). These recorders were worn throughout baseline and training to assess generalization. The recorders also were worn for 1 to 1.5 weeks prior to beginning baseline so that the subjects, and others at the work sites, would become accustomed to the presence of the recorder. Each recorder was outfitted with a blank 30 min tape before work.

In the classroom, a regular table-top recorder was used for 30 min per student, each day. Each student's 30 min segment was selected based on when the student was present at school and the type of activity that was occurring. For each student, a time was chosen during an activity that involved high rates of interaction between the student and a teacher, and where criticism was likely to occur. During the school taping, the classroom teacher activated the tape player at the beginning of the 30 min session. Thus, a total of 60 min of naturalistic recording was obtained for each participant each day.

Instructional Content

Social validation procedures similar to those reported by Goldfried and D'Zurilla (1969) were used to select samples of social situations and examples of appropriate social responses. The three teachers who referred the students (i.e., vocational trainer, classroom teacher, speech therapist) were asked to list examples of two types of criticism that occurred most often with each participant. The two types were personal criticism (e.g., "Your clothes are dirty") and work-related criticism (e.g., "You are late again").

Information gathered from teacher data was used to generate a list of training examples of the types of criticism that the student would likely receive in the work setting. Examples of criticism that were stated by more than one teacher, or that appeared frequently in the literature and were related to work performance (e.g., time management), were considered high priorities for training examples.

After a list of common criticisms was compiled, scenarios were generated that described interpersonal situations involving another person criticizing the participant. Pictures were drawn and scripts were written for use with these scenarios. Once the scenarios, complete with pictures and a short description, were developed, they were shown to a group of undergraduate college students majoring in special education ($N = 12$). These students provided feedback on the clarity of the pictures and the short descriptions or scenarios accompanying the pictures. Each of the students was asked to rate each scenario on a scale of 1 to 5, with 1 being unclear and 5 being very clear. The social validation ratings for all 10 pictures ranged from 3.4 to 5.0 ($M = 4.2$), which suggests that the pictures and scenarios were clear, thus, no revisions were made.

Dependent Variables and Data Collection Procedures

The social skill trained in this study was responding to criticism. Data on the students' responses to criticism were collected during training, during generalization probes to untrained stimuli after training, and in two generalization settings (work and school). Data on the acquisition of the cognitive-process components (described below) were also measured during training.

Responses to criticism were defined as any verbal behaviors that were displayed immediately after the criticism (i.e., within 10 sec.) such as talking, shouting, screaming, mumbling, or crying. If no response occurred after the criticism was given, this also was noted. Appropriate responses included acknowledgment of the criticism through an apology and a statement of correction, for example, "I'm sorry, I'll clean it up," or "I'm

sorry, I won't do it again." Inappropriate responses included not responding at all and excuses such as, "Well, Joe was talking to me."

Criticism was defined as any verbal admonishment from another person about the participant, the participant's behavior, or the participant's performance. Admonishments included statements of critique (e.g., "Your work yesterday was lousy") and statements of critique with a direction (e.g., "There are still smudges on that door, do it again").

Besides collecting data on responses to criticism, data also were collected on four variables related to the cognitive-process approach of responding to criticism: social decoding, social decision, social performance, and social evaluation skills. These behaviors were measured in the training setting after subjects were presented with five scenarios depicting workers being criticized.

Social decoding skills were defined as the skills used to discriminate or decode what was happening during a social interaction. Data were reported as percent correct and collected on nine behaviors: verbalizing the decoding rule, and asking and answering each of four questions about what was happening in the scenario, who was criticizing, why criticism was occurring, and how the person who was criticizing might feel. (For an example of correct responses to all components, see the training script in Table 1.) For all cognitive-process components, responses were scored as incorrect if students did not respond within 3 seconds to the scenario or stated the wrong rule, questions, or answers to the questions that accompanied each scenario.

Social decision skills were defined as the skills used to decide which response would best meet the demands of a social situation. When an individual is criticized, several responses may be possible. For example, one could get mad, cry, fail to respond, or apologize and offer to remedy the situation. In this study, data were collected on two behaviors: verbalizing the decision rule and stating the possible options to criticism (e.g., "Get mad") and the preferred option (i.e., apologizing and offering to remedy the situation).

Table 1

Example from Training Protocol

The trainer says:

"This is a picture of a worker like you. He is working slowly. His boss is telling him to hurry up and finish mopping because he has other chores to do. You be the worker and I'll be the boss. Remember to say the rules out loud and tell me what you would do." (Student's name), you need to mop faster, you have other chores to do.

The student says:
(Data is collected here)

(Social Decoding Skills)

1.0 "The first rule is understand what is going on.

- 1.1 So I ask myself, What is happening?
  Well, here the boss is upset with me, I am taking too long to mop and have other chores to do.
- 1.2 Then I think to myself, who is upset with me?
  The boss is upset with me
- 1.3 Next, I think to myself, why is the boss upset with me?
  He is upset because I am taking too long to mop.
- 1.4 Then I think to myself, how does the boss feel?
  He's mad."

(Social Decision Skills)

2.0 "The second rule is decide what to do.

- 2.1 I could ignore the boss or get mad. Those things wouldn't be good though because the boss would still be mad. Right? So, I am going to tell him that I am sorry and that I will try to work faster."

(Social Performance Skills)

3.0 "The third rule is do what I had decided to do.

- 3.1 So I say, I'm sorry, I'll work faster."

(Social Evaluation Skills)

4.0 "The fourth rule is what happened when I said I was sorry.

- 4.1 So, I ask myself, How does the boss feel now?
  I don't think he's as mad now.
- 4.2 Then I think, how do I feel now? I feel better since I said I'm sorry.
- 4.3 Finally, I ask myself, Did I do the right thing? I think saying I'm sorry was a good thing to do."

Social performance skills were defined as the overt responses made to a social situation. Once an individual has been criticized, has decoded the situation, and has decided what to do, he or she acts on that decision; that is, the individual responds to the criticism. Data were collected on (a) the participants' verbalization of the performance rule and on (b) their response to the criticism.

Social evaluation skills were defined as the skills used to judge whether or not the overt social response met the demands of the social situation. Once a response to a criticism had been made, the participant had to consider if the response resulted in a positive feedback, or at least avoided negative feedback from the other individual involved in the interaction. Within this component, data were collected on seven behaviors: verbalizing the evaluation rule and asking and answering three questions about how the other individual in the interaction felt, how they (the participants) felt, and if they had done the right thing.

Experimental Design and Condition

A multiple-baseline design across subjects was utilized to assess the effects of the cognitive-process approach. Experimental conditions included (a) baseline and (b) cognitive-process training for all three subjects with the addition of (c) intensive skill training for one subject.

Baseline. Baseline measures were collected in the training, work, and school settings. Training baseline consisted of 5- to 10-min individual sessions assessing the student's responses to all 10 social scenarios involving criticism. The student was shown a picture, given a brief description of what was happening in the picture, and asked what she would do in that situation. The students' responses were scored as correct if they provided an apology and a statement of correction. Data was only collected on the performance component of the cognitive-process approach because the other three components (i.e., decoding, deciding, and evaluating) did not occur naturally in an overt manner prior to training. During baseline, no feedback or reinforcement was given; however, each participant was praised occasionally for paying attention and listening.

Baseline measures also were collected during school hours when each student was in the classroom and at each student's work site. Each student's responses to criticism were tape-recorded in the generalization environments. At the end of the school day, each participant gave the tape recorder to the classroom teacher. The first author and an additional observer listened to the tapes and developed written instances of criticism and each student's response to criticism.

To ensure that enough opportunities to respond to criticism existed throughout this investigation, each student's vocational trainer was enlisted to deliver at least three criticisms during the 30-min taping period, 3 days per week (2 days per week for the student in the work experience site). Although these instances of criticism were planned, they were legitimate (i.e., the students were not criticized unjustly, or for things they were not responsible for). Even though the vocational trainers were aware that the students were participating in a study, they were naive to the specific purpose of the study.

Cognitive-process training. Training occurred three times per week for each student; sessions lasted 20 to 30 min each. Each training session was conducted by the first author. The four components (i.e., decoding, decision-making, performance, and self-evaluation) were taught using modeling, rehearsal, and feedback. At the beginning of each session, the trainer explained what was to be taught and then gave a rationale for why responding to criticism appropriately was important. Next, the trainer showed a picture of a social situation involving criticism. The trainer then modeled the cognitive-process approach. First, the trainer stated the social decoding rule (i.e., "The first rule is to understand what is going on"). Then she described the situation in the picture verbally by pointing out who was criticizing, what was happening, why it was happening, and how the individual who was criticizing might feel. Then, the trainer modeled the social decision component (i.e., "The second rule is, decide what to do"), identified the choices for responding, and chose a response to the social interaction. Next, the trainer modeled the social performance component by stating the rule (i.e., "Do what I decided to do"), and made the social

response. Finally, the trainer modeled the social evaluation component by verbalizing the rule (i.e., "What happened when I said I was sorry?"), and evaluated her performance by describing how the boss might feel now, how she felt now, and if her response to the situation was successful or unsuccessful.

After the trainer modeled all of the components, data was collected on the student's verbal rehearsal of the four process components in response to the same picture. During this rehearsal situation, the trainer played the boss, or the person doing the criticizing. If the participant had difficulty with any of the components, she was given verbal prompts to complete the process. Social reinforcement was used for correct responding. All five social scenarios were used during each training session (resulting in five training trials per session) but were presented in random order. A general summary of the training procedures are included in Table 2.

Intensive skill training. Intensive skill training was implemented on the social skill decoding component with Diane after training on all four components resulted in little progress. The training strategy was the same as described above, except that after modeling the entire process the trainer provided intensive instruction on the first component only (social decoding). Here the trainer modeled the scenario again, stopping after the social decoding rule. Diane just practiced the social decoding component for two trials.

Observers and Agreement

The first author and a second observer were used throughout the study to take data on training and to transcribe the tapes from the school and work settings. The second observer assessed reliability on training and generalization data. This second observer was an undergraduate student in special education and was naive about the purpose of the study. Before beginning to collect reliability measures, both were trained on the forms and procedures to be used and practiced transcribing generalization tapes to a criterion level of 80%. During training, the second observer collected data simultaneously with and independently of the first author for 30% of the training sessions. Agreement was

Table 2

General Social Skills Training Procedures

1. Presentation of training summary and rationale.
2. Presentation of first training picture and verbal description of social situation.
3. Model of social skills rules, as applied to situation.
   a. decoding
   b. decision
   c. performance
   d. evaluation
4. Role-play of social skills rules, as applied to same social situation.*
   (Prompts given for incorrect responding and social reinforcement given for correct responding.)
   a. decoding
   b. decision
   c. performance
   d. evaluation
5. Steps 2 - 4 repeated with four different pictures.
6. Five generalization probes administered using untrained pictures and social situations.*

*Data collected during this step.

calculated by taking the number of agreements on responses made by the subjects (i.e., correct or incorrect responses) and dividing by the number of agreements plus the number of disagreements (multiplied by 100). Agreements were defined as both observers recording the same response from a student on a particular item. Disagreements were defined as each observer recording a different response. Interobserver agreement scores for Claire were 93% (80% to 100%); 93% for Diane (91% to 100%); and 91% for Jenny (89% to 100%).

The data from the micro-cassette tapes, used in the work and school settings, also were evaluated by the second observer. Each criticism was transcribed, verbatim, onto paper. Evaluating the transcripts consisted of counting the number of appropriate and inappropriate responses made by the students as well as rating the content of each student's responses. Reliability was assessed for 36% of the generalization tapes.

Agreement was calculated by taking the number of agreements and dividing by the number of agreements plus the number of disagreements and multiplying by 100. Agreements were defined as both observers rating the responses to criticism the same way. Specifically, each response was rated a minus (-) if it did not contain both a statement of apology (e.g., "I'm sorry") and a corrective statement (e.g., "I'll do it over"). If the response included both an apology and a statement of correction (e.g., "I'm sorry, I'll try to work faster"), it was rated a plus (+). Disagreements were defined as each observer rating a participant's response differently. Inter-rater agreement scores for the generalization transcripts ranged from 50 to 100% ($\underline{M}$ = 97%). Reliability scores for each student were as follows: Claire, 100%; Diane, 50 to 100% ($\underline{M}$ = 92%); and Jenny, 100%.

Results

Training Data

Figure 1 shows the baseline and training data for Claire and Jenny for each of the social skill components trained (i.e., decoding, deciding, performing, and evaluating). Although the data for Claire and Jenny show improving performance across all four components,

Diane's data (shown in Figure 2) indicate that her performance did not improve as rapidly or consistently as intervention continued.

At the beginning of training, Claire performed only 7% of the decoding components, 0% of the deciding components, 10% of the performing components, and 14% of the evaluating components. When the study was terminated (Day 12), she performed 96% of the decoding components, 100% of the deciding components, 100% of the performing components, and 94% of the evaluating components. Claire's performance on the decoding and evaluating components showed a steadily increasing trend throughout training. Alternatively, the number of correct steps that she achieved on the middle components (i.e., deciding and performing) stayed at near zero levels until the fourth day of training, when both began to increase more rapidly.

Jenny's performance was similar to Claire's. On the first day of training Jenny performed 33% of the decoding components, 0% of the deciding components, 0% of the performing components, and 46% of the evaluating components. At the end of training (Day 8), she performed 93% of the decoding components, 100% of the deciding components, 100% of the performing components, and 100% of the evaluating components. As mentioned above, Jenny's overall performance was very much like Claire's. That is, initially she responded somewhat higher on the first and last components (i.e., decoding and evaluating) than on the middle two (i.e., deciding and performing). On the third and fourth days of training, the number of correct responses increased greatly for deciding and performing, so that by the fifth day of training there was little difference among the data for all four components.

Baseline and training data for Diane are displayed in Figure 2. Diane's training performance did not follow the same pattern as Claire's and Jenny's. Initially, Diane completed 11% of the decoding components, 0% of the deciding components, 0% of the performing components, and 31% of the evaluating components. These levels of performance remained relatively stable until after the intensive training strategy was

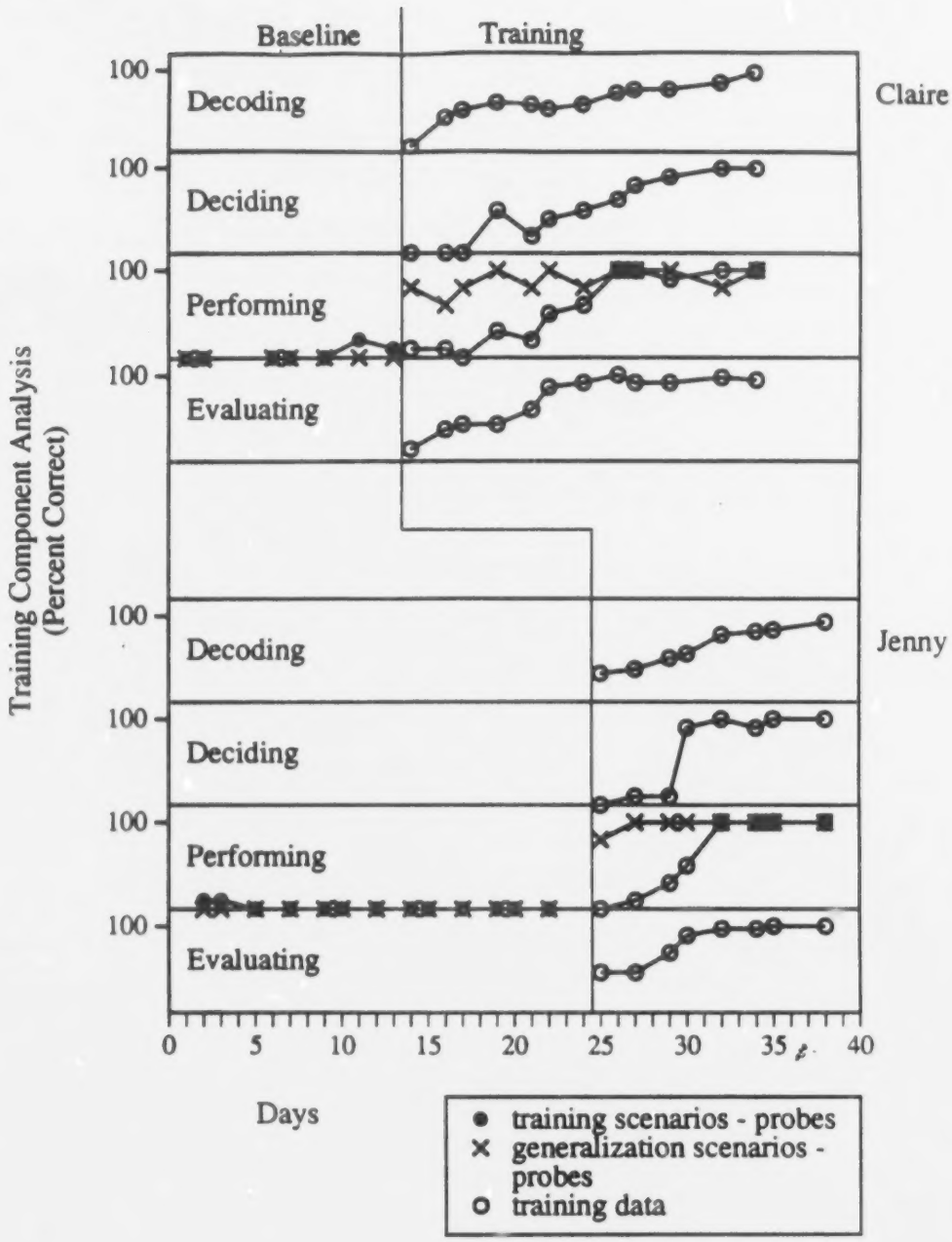

Figure 1. Percent correct on process component steps and generalization probes to untrained exemplars.

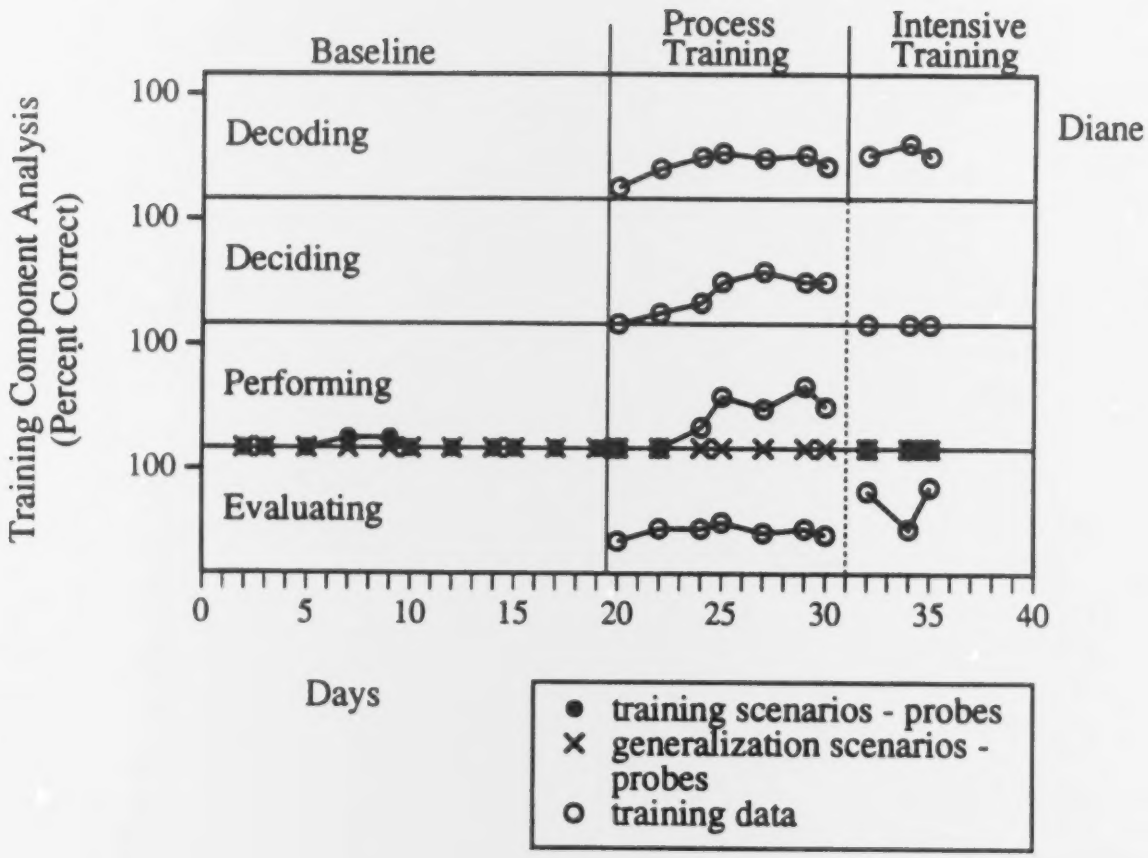

Figure 2. Percent correct on process component steps, intensive skill training, and generalization probes to untrained exemplars.

implemented with only the decoding component. After three days of this training, Diane completed an average of 45% of the decoding components, which was higher than the 34% that she had averaged previously. Interestingly, her performance on the deciding and performing components dropped to zero, but raised to an average of 68% on the evaluating component. Thus, even though intervention was not implemented with the evaluation component, it may have been affected by the training on the decoding component, showing a possible relationship between the two components.

Generalization to Untrained Scenarios

Figure 1 shows that Claire and Jenny exhibited zero levels of performance to untrained scenarios during baseline. Once training was introduced for both participants, performance increased from 0% to 80%, showing a rapid level change. Performance was relatively stable for Claire, dropping to 60% on the second training day and alternating between 80% and 100% for the next five days. Her performance stabilized at 100% on the eighth day of training and remained there for the duration of the study. Jenny reached 100% accuracy on the second day of training and stayed there for the remainder of the study. It is interesting to note that although Claire's and Jenny's rate of correct responding on the probes to untrained scenarios increased substantially with the onset of training, their number of correct responses on the performance component of training did not reflect similar changes.

As can be seen in Figure 2, Diane also exhibited zero levels of performance for untrained stimuli during baseline. Her performance did not change at all with the introduction of training and remained at 0% for the remainder of the study.

Generalization to Natural Environments

Data collected in the natural environments showed little indication of generalization. Unfortunately, the generalization results were compromised because few instances of criticism actually occurred in the generalization environments. Even though vocational trainers had been asked to criticize the students (when appropriate), few instances of criticism occurred when the students were being tape recorded. For example, in the work

setting the number of opportunities for responding to criticism varied across days with the mean number of opportunities being 1.20.

In both the school and work settings there was little change in performance from baseline to training; However, on the 28th day of the study, Claire responded correctly to criticism on one of three opportunities in the school setting. She also demonstrated a correct response in the work setting on the 26th day of the study.

Anecdotal data. Near the end of the study, Jenny's vocational trainer reported that Jenny had responded to criticism in a different way than she ever had before. The vocational trainer called the senior author and said that even though she did not know what the students were being trained to do when criticized, Jenny had responded in a manner not previously witnessed by the trainer. The vocational trainer stated that when she criticized Jenny (on the 31st and again on the 36th day of training), Jenny responded with an apology and a statement of correction. Unfortunately, this did not occur during a time when the participant was wearing the tape recorder.

Discussion

With a cognitive-process approach, individuals are taught a generative process of social behavior rather than specific component behaviors (Hollin & Trower, 1988). Although this process has been described theoretically (e.g., Argyle & Kendon, 1967; Ladd & Mize, 1983; McFall, 1982), there are few applications of its use. Since the approach relies on receptive and expressive language skills, some may think it an inappropriate strategy for individuals with mental retardation. However, Park and Gaylord-Ross (1989) demonstrated the effectiveness of using this approach with individuals with mental retardation.

This study, too, demonstrated that two of the three participants with moderate mental retardation could also learn this approach. That the approach teaches a strategy that should be generic to all social situations would seem to be desirable. Additionally, a cognitive-process approach would seem important because it actively involves learners and requires them to analyze, discriminate, and respond to multiple stimuli. Interestingly, both Jenny

and Claire (the two participants who learned the process) commented that they had to "think so hard" during training. Perhaps, traditional interventions have not taught individuals with moderate mental retardation to be active participants in their learning, but instead have involved them only as passive learners who make simple responses to noncomplex stimuli.

One student, Diane, demonstrated consistently low rates of performance throughout training. Although no definitive reasons can be identified for her performance, a number of differences exist between Diane and the other two participants. First, her IQ score was lower than Jenny's and Claire's. Second, Diane was not particularly interested in her job, did not spend much time at work, and needed a lot of supervision. Perhaps Diane was not motivated enough to learn the process and did not care whether or not she responded to criticism in an appropriate manner. Clearly, individuals targeted for training must have a vested interest in the goal of training if training is to be effective (Chadsey-Rusch, in press).

Another possible explanation for Diane's lower performance could be that the process was too complicated for her to learn as it was presented (i.e., the strong emphasis on language) (Whitman, 1990). It is possible that adaptations could be made for individuals who have trouble learning this approach. One alternative that was explored in this study was to train one component at a time, thus reducing the number of steps that the individual has to learn at one time. Although this alternative was explored only briefly, data indicated that the procedure resulted in performance increases on the trained component (decoding). Another alternative that might facilitate learning would be to use picture cues along with training. Picture cues reduce language demands and have been used in combination with self-instructional strategies to teach vocational skills (Agran, Fodor-Davis, Moore, & Deer, 1989; Wacker & Berg, 1983).

Certainly an important issue to consider from this study was the lack of generalization to the natural environment. The lack of generalization to the school and work settings may have been due to a number of factors. First, Claire and Jenny seemed to be in the

acquisition stage of learning the process; that is, they did not seem fluent in using the components. It may be that students with moderate mental retardation must practice complex strategies an undetermined amount of time prior to being able to generalize their use of the strategy. Future research should document where in the training process generalization begins to occur; this type of documentation has only occurred in a few studies (e.g., Hughes & Rusch, 1989).

A second factor limiting generalization may have been due to an insufficient number of opportunities to measure generalization. It is entirely possible that occurrences of criticism in the natural environment were not enough to measure the extent of the generalization. Future research should focus on other methods of collecting this type of data (i.e., behaviors that occur inconsistently or occur in low frequencies). Such methods might include using self-reports in combination with co-worker and supervisor reports or planting an unknown observer in the natural environment.

Because criticism occurred infrequently, one might question whether handling criticism appropriately was an appropriate target for training. Work-related literature, however, shows that employers find accepting criticism to be an important skill for employees to have (Salzberg, Agran, & Lignugaris/Kraft, 1986). Further, none of the three subjects responded to criticism appropriately and one subject (Jenny) was nearly fired from her job for not responding to criticism appropriately.

Another issue that may have affected the generalization results concerns the setting used for training. In this study, and in the study by Park and Gaylord-Ross (1989), training was conducted in analogue settings. Investigators have suggested that generalization results may be enhanced by training in the natural environment (Brown, Nisbet, Ford, Sweet, Shiraga, York, & Loomis, 1983; Coon, Vogelsberg, & Williams, 1981; Marchetti, McCartney, Drain, Hooper, & Dix, 1983). However, it may not always be convenient for staff to conduct in-vivo training. For example, some important behaviors (e.g., responding to criticism) occur infrequently, making it difficult for staff always to be present when they

occur. One solution to this might be to have co-workers implement training (Nisbet & Hagner, 1988; Rusch & Menchetti, 1981). This type of training, however, may prove to be obtrusive in terms of drawing unwanted attention to the worker or interrupting naturally occurring interactions; it may also impede the natural development of friendships between the worker and his or her co-workers (Chadsey-Rusch, 1990). Another concern is that co-workers may not always work closely enough to provide training when needed, and it may be difficult for co-workers to teach a generative process of social skills.

The unique and promising feature of a process approach is that it may facilitate the generalization of learned skills by giving the learner a generic strategy for dealing with a variety of social situations. Thus, if a cognitive-process approach does indeed facilitate generalization, perhaps it holds the answer for training individuals who are placed in work settings where in-vivo training is not always possible. Future research must address this promise more fully.

One of the interesting findings from this study was that performance to untrained stimuli did not occur until after process training was implemented. That is, repeated exposure to the probe scenarios did not result in the participants learning the targeted response. This result suggests that the process does indeed play a role in generalization. Also, even though Claire and Jenny had reached criterion on the performance component in training, they did not generalize their responses to the natural settings, indicating that proficiency on the performance component alone does not guarantee generalization to the natural environment. Clearly, future research needs to investigate the role that a process approach may play in facilitating generalization.

Another interesting finding from this study was the possible relationship between the first and last components (i.e., decoding and evaluating) as evidenced by Diane's data. In decoding, individuals may consider the social situation in terms of what is happening, why it is happening, who is involved in the interaction, and how the person feels. In evaluating, individuals examine what has just taken place by asking themselves how

others feel, how they feel, and whether they think they did the right thing. Given these similar features of the two components, it is not surprising that when the intensive training strategy was implemented with Diane, her performance increased not only on the trained component (decoding), but also on the evaluation component. Future research is needed to examine the relationship between the components.

A final issue concerns training specific responses to criticism. It could be argued that participants were trained to be passive in responding to criticism by apologizing and offering to remedy the situation. Although this is a valid argument, it should be noted that when an employer or a supervisor criticizes a worker, it may be best for that worker to avoid arguing. The use of a process approach, however, could allow the individual greater freedom in choosing responses, as well as teaching learners to discriminate between appropriate and inappropriate instances of criticism.

In summary, this study is one of the few attempts to use a cognitive-process approach to teach social skills to individuals with moderate mental retardation. The results from this study showed that two of the three participants learned the approach and evidenced generalization to untrained stimuli. It is possible that this type of training is more effective with some individuals than others, particularly those who are motivated to learn, have higher IQ scores, and better language skills. For those individuals who have difficulty acquiring the process, steps may be taken to modify the procedures, as was done in this study. Because appropriate social skills are crucial to the success of workers with handicaps in competitive employment settings (Chadsey-Rusch, 1986; Greenspan & Shoultz, 1981; Salzberg, McConaughy, Lignugaris/Kraft, Agran, & Stowitschek, 1987), there is a need for training approaches that are effective, convenient to use, and teach the complexities of social interactions. The cognitive-process approach may be one strategy that meets that need; however, further research is needed.

Notes

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[2]A copy of this material can be obtained by writing to: Janis Chadsey-Rusch, Transition Institute, College of Education, University of Illinois, 110 Education, 1310 S. Sixth St., Champaign, IL 61820.

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